

# Tactical Combat Casualty



September 2012



# Tactical Evacuation Care



# OBJECTIVES

- **DESCRIBE** the differences between MEDEVAC and CASEVAC
- **DESCRIBE** the differences between Tactical Field Care and Tactical Evacuation Care
- **DESCRIBE** the additional assets that may be available for airway management and electronic monitoring
- **DISCUSS** the indications for and administration of Tranexamic Acid during tactical evacuation



# OBJECTIVES

- **DISCUSS** the management of moderate/severe TBI during tactical evacuation
- **DESCRIBE** additional options that may be available in TEC for resuscitation from hemorrhagic shock
- **LIST** the indications and administrative controls applicable to giving blood component therapy and



# Tactical Evacuation

- Casualties need evacuation as soon as feasible after significant injuries.
- Evacuation asset may be a ground vehicle, aircraft, or boat.
- **Evacuation time is highly variable - significant delays may be encountered.**
- Tactical situation and hostile threat to evacuation platforms may differ markedly from one casualty scenario to another.
- The Tactical Evacuation phase allows for additional medical personnel and equipment to be used.



# Evacuation Terminology

- **MEDEVAC**: evacuation using special dedicated medical assets marked with a Red Cross
  - MEDEVAC platforms are non-combatant assets
- **CASEVAC**: evacuation using non-medical platforms
  - May carry a Quick-Reaction force and provide close air support as well
- **Tactical Evacuation (TACEVAC)** – this term encompasses both types of evacuation above



# Aircraft Evacuation Planning

- **Flying rules vary widely among different aircraft and units**
- **Consider:**
  - **Distances and altitudes involved**
  - **Day versus night**
  - **Passenger capacity**
  - **Hostile threat**
  - **Medical equipment**
  - **Medical personnel**
  - **Icing conditions**



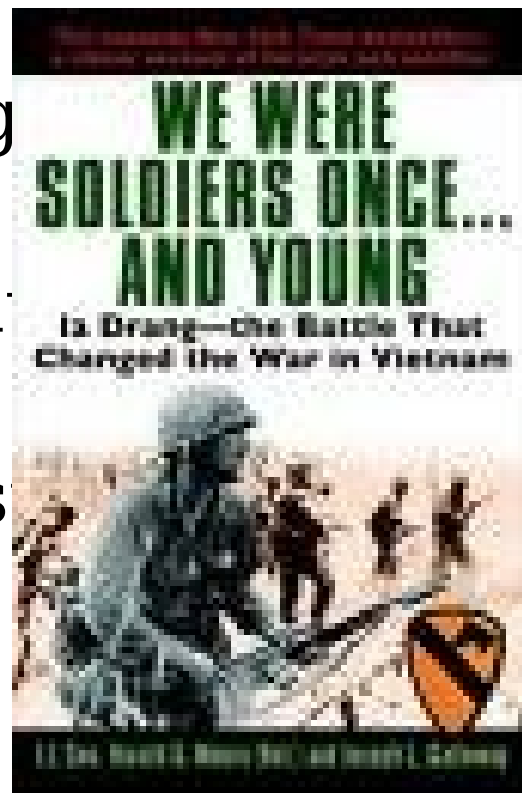


-



# CASEVAC vs. MEDEVAC: The Battle of the Ia Drang Valley

- 1st Bn, 7th Cavalry in Vietnam
- Surrounded by 2000 NVA - heavy casualties
- Called for MEDEVAC
- Request refused because landing was not secure
- Eventual pickup by 229th Assault Helo Squadron after long delay
- Soldiers died because of this mis
- Must get this part right







# Ground Vehicle Evacuation

- More prevalent in urban-centric operations in close proximity to a medical facility
- May also be organic to unit or designated MEDEVAC





# Tactical Evacuation Care

- TCCC guidelines for care are largely the same in TACEVAC as for Tactical Field Care.
- There are some changes that reflect the additional medical equipment and personnel that may be present in the TEC setting.
- This section focuses on those differences.





# Airway in TACEVAC

- Additional Options for Airway Management
  - **Supraglottic airway**
  - Endotracheal Intubation
- Confirm ETT placement with CO2 monitoring
- These airways are advanced skills not taught in basic TCCC course





# Breathing in TACEVAC

- Watch for tension pneumothorax as casualties with a chest wound ascend into the lower pressure at altitude.
- Pulse ox readings will become lower as casualty ascends unless supplemental oxygen is added.
- Chest tube placement may be considered if a casualty with suspected tension pneumo fails to respond to needle decompression



# Supplemental Oxygen in Tactical Evacuation Care

Most casualties do not need supplemental oxygen, but have oxygen available and use for:

- Casualties in shock
- Low oxygen sat on pulse ox
- Unconscious casualties
- Casualties with TBI  
(maintain oxygen saturation > 90%)
- Chest wound casualties





# **Tranexamic Acid (TXA)**

## **5. Tranexamic Acid (TXA)**

**If a casualty is anticipated to need significant blood transfusion (for example: presents with hemorrhagic shock, one or more major amputations, penetrating torso trauma, or evidence of severe bleeding)**

- Administer 1 gram of tranexamic acid (TXA) in 100 cc Normal Saline or Lactated Ringer's as soon as possible but NOT later than 3 hours after injury.**
- Begin second infusion of 1 gm TXA after Hextend or other fluid treatment.**

**\* Note: Per the Assistant Secretary of Defense**



# **TXA**

## **Administration - 2nd Dose**

- **Typically given after the casualty arrives at a Role II/Role III medical facility.**
- **May be given in Tactical Evacuation Care if the first dose was given earlier, and fluid resuscitation has been completed before arrival at the medical facility.**
  - **Should NOT be given with Hextend or through an IV line with Hextend in it**
  - **Inject 1 gram of TXA into a 100-cc bag of normal saline or lactated ringer's**
  - **Infuse slowly over 10 minutes**



# Tactical Evacuation Care

## 6. Traumatic Brain Injury

**a. Casualties with moderate/severe TBI should be monitored for:**

- 1) Decreases in level of consciousness**
- 2) Pupillary dilation**
- 3) SBP should be  $>90$  mmHg**
- 4) O<sub>2</sub> sat  $> 90$**

Continued...





# Tactical Evacuation Care

## 6. Traumatic Brain Injury

a. Casualties with moderate/severe TBI should be monitored for:

- 5) Hypothermia
- 6) PCO<sub>2</sub> (If capnography is available, maintain between 35-40 mmHg)
- 7) Penetrating head trauma (if present, administer antibiotics)
- 8) Assume a spinal (neck) injury until cleared

**Continued**

Continued...



# Tactical Evacuation Care

## 6. Traumatic Brain Injury

**b. Unilateral pupillary dilation accompanied by a decreased level of consciousness may signify impending cerebral herniation; if these signs occur, take the following actions to decrease intracranial pressure:**

- 1) Administer 250cc of 3% or 5% hypertonic saline bolus**
- 2) Elevate the casualty's head 30 degrees**

Continued...



# Tactical Evacuation Care

## 6. Traumatic Brain Injury

### b. (Continued)

#### 3) Hyperventilate the casualty

- a) Respiratory rate 20
- b) Capnography should be used to maintain the end-tidal CO<sub>2</sub> between 30-35 mmHg
- c) The highest concentration (FIO<sub>2</sub>) possible should be used for hyperventilation

Continued...



# Tactical Evacuation Care

## 6. Traumatic Brain Injury

### b. (Continued)

#### Notes:

- Do not hyperventilate unless signs of impending herniation are present.
- Casualties may be hyperventilated with oxygen using the bag-valve-mask technique.



# Fluid Resuscitation in TACEVAC

## 7. Fluid Resuscitation

Reassess for hemorrhagic shock (altered mental status in the absence of brain injury and/or change in pulse character). **If BP monitoring is available, maintain target systolic BP 80-90 mmHg.**

### a. If not in shock:

- No IV fluids necessary.
- PO fluids permissible if conscious and can swallow.

### b. If in shock and blood products are not available:

- Hextend 500-mL IV bolus
- Repeat after 30 minutes if still in shock.
- **Continue resuscitation with Hextend or crystalloid solution as needed to maintain target BP or clinical improvement.**

Continued...



# Fluid Resuscitation in TACEVAC

## 7. Fluid Resuscitation

- c. If in shock and blood products are available under an approved command or theater protocol:
  - Resuscitate with 2 units of plasma followed by packed red blood cells (PRBCs) in a 1:1 ratio. If blood component therapy is not available, transfuse fresh whole blood. Continue resuscitation as needed to maintain target BP or clinical improvement.
- d. If a casualty with an altered mental status due to suspected TBI has a weak or absent peripheral pulse, resuscitate as necessary to maintain a palpable radial pulse. If BP monitoring is available, maintain target systolic BP of at least 90 mmHg.



# Blood Product Administration

- 1) The success of blood product administration in improving the survival of trauma patients is unquestioned, and blood products are the standard for **hospital-based** trauma care in both military and civilian settings.



# Blood Product Administration

- 2) The additional benefit gained from starting blood products in the **prehospital** phase has not yet been established in the medical literature, but the Defense Health Board has agreed that this therapy may be beneficial in the prehospital setting if blood products are available.





# Blood Product Administration

- 3) Blood product administration should be initiated if feasible for any casualty who meets protocol criteria ***and is still enroute to the medical treatment facility***. There is no minimum transport time below which blood product therapy should not be initiated if protocol criteria are met. Casualties who have absent radial pulse and/or decreased mental status due to hemorrhagic shock in the prehospital setting have a very high mortality rate and are in need of blood



# Blood Transfusion Protocols

- Transfusion of blood products **should not be attempted in the absence of a theater- or command-approved protocol.**
- Blood products should be transfused **only by providers that have been appropriately trained** in the governing protocol.



# Damage Control Resuscitation

- Standard of care for severe shock is now “1:1” therapy
  - One unit of plasma for every unit of packed red cells
  - Different from previous focus primarily on packed red cells
  - Plasma helps to control hemorrhage by promoting clotting
  - Has been shown to increase survival



# Protocols for FDA-Compliant Blood Products (Component Therapy)

- Issues to address include:
  - Minimum provider level required
  - Training in blood product administration
  - Preparation and transport of blood products
  - Transfusion equipment
  - Which casualties need blood products
  - Verifying correct blood type



# Protocols for FDA-Compliant Blood Products (Component Therapy)

- Issues to address include (cont):
  - Which products should be given and how much
  - Transfusion procedures
  - Management of transfusion reactions
  - Documentation of blood product administration



# **Non - FDA Compliant Blood Products (Fresh Whole Blood (FWB))**

- Must be administered IAW Assistant Secretary of Defense for Health Affairs memo of 19 March 2010
- Used only in emergencies when:
  - No FDA-compliant blood products are available
  - Complying with a command-approved protocol
  - Providers trained in the protocol
- Transfusing FWB may save lives when blood components are not available



# Protocols for Non-FDA Compliant Blood Products

- Issues to address include:
  - Minimum provider level required
  - Training in FWB administration
  - Transfusion equipment
  - Which casualties need FWB
  - Prescreened donor pool
  - Screening for infectious agents
  - Verifying blood type
  - Transfusion procedures



# Protocols for Non-FDA Compliant Blood Products

- Issues to address include (cont):
  - How much FWB should be given
  - Management of transfusion reactions
  - Documentation of blood product administration
  - Post-transfusion monitoring of donor and recipient





# Hypothermia Prevention in TACEVAC

Remember to keep the casualty on an insulated surface or get him/her on one as soon as possible.

Apply the Ready-Heat Blanket from the Hypothermia Prevention and Management Kit (HPMK), to the casualty's torso (directly on the skin) and cover the casualty with the Heat-Reflective Shell (HRS).





# Hypothermia Prevention in TACEVAC

If a HRS is not available, the previously recommended combination of the Blizzard Survival Blanket and the Ready Heat blanket may also be used.



Use a portable fluid warmer capable of warming all IV fluids including blood products.



# Remember Prevention of Hypothermia in Helicopters!



in wind and altitude cold result in cold s  
ection especially important for casualties  
n shock and burn casualties



# **CPR in Tactical Evacuation Care**

## **18. CPR in TACEVAC Care**

**a. Casualties with torso trauma or polytrauma who have no pulse or respirations during TACEVAC should have bilateral needle decompression performed to ensure they do not have a tension pneumothorax. The procedure is the same as described in section 2 above.**



# **CPR in Tactical Evacuation Care**

## **18. CPR in TACEVAC Care**

**b. CPR may be attempted during this phase of care if the casualty does not have obviously fatal wounds and will be arriving at a facility with a surgical capability within a short period of time. CPR should not be done at the expense of compromising the mission or denying lifesaving care to other casualties.**



# TACEVAC CARE - Hoisting



- Rigid Litters Only When Hoisting!
- Check and double-check rigging

A photograph showing the silhouettes of two helicopters and several people against a bright, hazy sunset sky. The helicopters are positioned in the foreground and middle ground, with their rotors visible. People are standing around the helicopters, some appearing to be working on them. The overall scene is backlit by the low sun, creating a strong silhouette effect.

Questions?



# TACEVAC Care for Wounded Hostile Combatants

- Principles of care are the same for all wounded combatants
- Rules of Engagement may dictate evacuation process
- Restrain and provide security
- Remember that each hostile casualty represents a potential threat to the provider and the unit and take appropriate measures
- **They still want to kill you.**







# Tactical Evacuation Care Summary of Key Points

- Evacuation time is highly variable
- Thorough planning is key
- Similar to Tactical Field Care guidelines but some mo





# Convoy IED Scenario

## Recap from TFC

The last medical interventions during TFC were:

- Placed tourniquet on both bleeding stumps
- Disarmed
- Placed NPA
- Established IV
- Administered 1 gm TXA and 500 ml Hextend®
- IV antibiotics
- Provided hypothermia prevention



# Convoy IED Scenario

## What's Next?

- Casualty is now conscious but is confused
- Reassess casualty for ABCs
  - NPA still in place
  - Tourniquets in place, no significant bleeding
- Attach electronic monitoring to casualty
  - Heart rate 140; systolic BP 70
  - O2 sat = 90%



# Convoy IED Scenario

## **What's next?**

- Supplemental Oxygen
  - Why?
    - Casualty is still in shock

## **What's next?**

- Administer Plasma:PRBCs in 1:1 ratio if available
- If blood products not available, 2<sup>nd</sup> bolus of Hextend® 500ml
  - Why?
    - Casualty is still in shock



# Convoy IED Scenario

## What's next?

- Inspect and dress known wounds and search for additional wounds

## What's next?

- Try to Remove tourniquets and use hemostatics?
  - No
  - Why? THREE reasons:
    - Short transport time - less than 2 hours from application of tourniquets
    - No distal extremities to lose
    - Casualty is in shock



**Questions/Comments**